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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/692,840	10/24/2003	Rudolf M. Smaling	9501-70665	9235
23643	7590	10/12/2006		
BARNES & THORNBURG LLP 11 SOUTH MERIDIAN INDIANAPOLIS, IN 46204				
			EXAMINER HANDAL, KAITY V	
			ART UNIT 1764	PAPER NUMBER

DATE MAILED: 10/12/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/692,840

Applicant(s)

SMALING ET AL.

Examiner

Kaity Handal

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 31 July 2006.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☐ Claim(s) _____ is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-11 and 17-23 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. _____.
 - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO/SB/08)
Paper No(s)/Mail Date _____
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: _____

DETAILED ACTION

Claim Rejections - 35 USC § 112

1. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

2. Claims 5-6 are rejected under 35 U.S.C. 112, second paragraph. Claims 5-6 depend on claim 1 which recites an air/fuel mixture. It is unclear as to how a mixture of air and fuel can contain no fuel as recited in claims 5-6. Is a mixture claimed or just air? The claims are so unclear as to preclude examination on their merits.

Claim Rejections - 35 USC § 102

3. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

4. Claims 1, 10, 17-18, and 20-23 are rejected under 35 U.S.C. 102(b) as being anticipated by Numata et al. (US 2002/0000067 A1).

With respect to claim 1, Numata teaches the method of operating a fuel reformer (fig. 1, 30) comprising the steps of: advancing a first air/fuel mixture with a first air-to-

fuel ratio into the fuel reformer (30), and operate the air/fuel input assembly so as to advance a second air/fuel mixture (page 1, paragraph [0017], lines 7-15). Numata further teaches the method of determining if a soot purge of the soot trap/partition (34) is to be performed and generate a purge-soot signal in response thereto (page 2, paragraph [0024], lines 1-10).

With respect to claim 10, Numata teaches wherein the determining step comprises generating a high-load control/start-up signal when an engine associated with the fuel reformer experiences a high load condition, and the step of advancing the second air/fuel mixture comprises advancing the second air/fuel mixture in response to generation of the high-load/start-up control signal (page 3, paragraph [0033]).

With respect to claims 17 and 20, 22-23, Numata teaches a method of operating a fuel reformer (fig.1, 30) comprising the step of: entrapping soot generated by the fuel reformer in a soot trap/partition (34), and advancing air, at a predetermined time intervals, in the absence of fuel into the fuel reformer so as to combust soot present in the soot trap/partition (34) (page 2, paragraph [0024], lines 1-11).

Numata indirectly teaches the step of determining the amount of soot within the fuel reformer housing (30), wherein the advancing step comprises advancing air in the absence of fuel if the amount of soot within the fuel reformer housing is greater than or equal to a predetermined amount. Numata teaches having combusting soot at predetermined time intervals, and given that the predetermined time intervals are set based on the expected amount of soot that would accumulate in partition (34)

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over a time period, after which soot is removed by executing the soot removing routine at the predetermined time intervals (page 3, paragraph [0024], lines 13-18), therefore Numata does teach indirectly the step of determining the amount of soot within the fuel reformer housing (30).

With respect to claim 18, Numata teaches the step of advancing a mixture of fuel and air into the fuel reformer housing prior to the step of advancing air in the absence of fuel into the fuel reformer housing (page 2, paragraph [0023], lines 8-23).

With respect to claim 21, Numata teaches wherein the step of advancing air in the presence of fuel into the fuel reformer subsequent to completion of the step of advancing air in the absence of fuel (page 2, paragraph [0024], lines 12 – page 3, lines 1-4).

5. Claims 1-4 and 7-8 are rejected under 35 U.S.C. 102(e) as being anticipated by Daniel et al. (US 7,014,930 B2).

The applied reference has a common inventors with the instant application. Based upon the earlier effective U.S. filing date of the reference, it constitutes prior art under 35 U.S.C. 102(e). This rejection under 35 U.S.C. 102(e) might be overcome either by a showing under 37 CFR 1.132 that any invention disclosed but not claimed in the reference was derived from the inventor of this application and is thus not the invention "by another," or by an appropriate showing under 37 CFR 1.131.

With respect to claims 1 and 8, Daniel teaches a method of operating a plasma fuel reformer (fig. 3, 12) assembly comprising: a plasma fuel reformer having (i) an

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air/fuel input assembly/fuel injector (fig. 1, 38) (ii) an electrode assembly (fig. 2, 54 & 56) comprising a first electrode (54) and a second electrode (56) that is spaced apart from the first electrode (54) (as illustrated), the method comprising the steps of: generating a plasma arc between the first and second electrodes (col. 4, lines 31-35); advancing a first air/fuel mixture with a first air-to-fuel ratio into the plasma arc (col. 4, lines 45-51), determining if a soot purge of the soot trap is to be performed and generating a purge-soot signal in response thereto, and advancing a second and third air/fuel mixture having a second air-to-fuel ratio greater than the first air-to-fuel ratio into the plasma arc (col. 6, lines 36-56).

With respect to claim 2, Daniel teaches wherein the determining step comprises the step of sensing the amount of soot within the soot trap/the pressure drop across the soot trap/fuel reformer (col. 17, lines 64-67 and col. 18, lines 1-14),

With respect to claim 3, Daniel teaches wherein the sensing step includes the step of generating a soot accumulation control signal when the amount of soot particulate accumulation within the plasma fuel reformer/soot trap reaches a predetermined level (col. 18, lines 1-14), and operating the air/fuel input assembly to advance the second air/fuel mixture in response to generation of the soot-content control signal (col. 18, lines 27-51).

With respect to claim 4, Daniel teaches wherein advancing the second air/fuel mixture includes advancing the second air/fuel mixture for a predetermined period of time to purge the plasma fuel reformer/soot trap (col. 18, lines 37-51) and (col. 13, lines 1-27).

With respect to claim 7, Daniel teaches determining when a predetermined period of time has elapsed since soot was last purged from the plasma fuel reformer/soot trap, and generating a time-lapsed control signal in response thereto, and operate the air/fuel input assembly to advance the second air/fuel mixture in response to generation of the time-lapsed control signal (col. 18, lines 37-51) and (col. 13, lines 1-27).

Claim Rejections - 35 USC § 103

6. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

7. Claims 9 and 19 are rejected under 35 U.S.C. 103(a) as being unpatentable over Numata et al. (US 2002/0000067 A1), as applied to claims 1 and 17, and further in view of Christen et al. (US 2003/0039871 A1).

With respect to claims 9 and 19, Numata discloses all claim limitations as set forth above but fails to show wherein the determining step comprises detecting a reformer shutdown request control signal, and the step of advancing the second air/fuel mixture comprises advancing the second air/fuel mixture in response to detection of the reformer shutdown request control signal and ceasing operation of a fuel injector. Christen teaches controlling a fuel cell reformer system (fig. 2) wherein the system is configured such that controller (40) controls the flow of fuel via valve

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(34) and air via valve (33) into a reformer (16) (page 2, paragraph [0026]), and wherein shutdown comprises advancing air/fuel/water mixture in response to detection of the reformer shutdown request control signal and ceasing operation of a fuel injector/valve (34) in order to allow possible soot deposits to be burned off (page 2, paragraph [0019], lines 1-4).

It would have been obvious to one having ordinary skill in the art at the time the invention was made to advance the second air/fuel mixture in response to detection of the reformer shutdown request control signal and ceasing operation of a fuel injector in Numata's apparatus, as taught by Christen, in order to allow possible soot deposits to be burned off.

Response to Arguments

35 USC 112 Rejection

Rejection made under 35 USC 112 to the claims (2-3) made by the examiner is withdrawn due to applicant's amendment.

Prior Art

Applicant's arguments with respect to the prior art of Smaling and Bauer being owned by ArvinMeritor at the time the invention of the subject patent application was made have been fully considered and are persuasive. Therefore, the rejection of claims 1-8 has been withdrawn. However, upon further consideration in view of the amendments to the claims, a new ground(s) of rejection is made in view of Daniel et al. as set forth above.

Conclusion

THIS ACTION IS MADE FINAL. Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Kaity Handal whose telephone number is (571) 272-8520. The examiner can normally be reached on M-F 8-5.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Glenn Caldarola can be reached on (571) 272-1444. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

KH



9/30/2006


ALEXA DOROSHENK NECKEL
PRIMARY EXAMINER